

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the subject application:

Listing of Claims:

1. (Cancel)
2. (Cancel)
3. (Cancel)
4. (Cancel)
5. (Cancel)
6. (Cancel)
7. (Currently Amended) A method comprising:

scheduling a sequence of machine-executable instructions;

creating a conflict graph based on the sequence of machine-executable
instructions, the conflict graph having a plurality of nodes and a
number of edges, each node representing a data element accessed
by at least one of the sequence of machine-executable instructions
instruction, and each edge, if any, connecting a pair of the plurality

of nodes, ~~and representing~~ to represent a potential hardware resource conflict;

coloring the conflict graph to generate a colored conflict graph by
assigning a color to each of the plurality of nodes, each color
representing a hardware resource; and
creating a data layout by mapping each data element to a memory
location, the memory location mapping to a corresponding hardware
resource.

8. (Original) The method of claim 7, wherein said assigning a color to each of the plurality of nodes comprises, for a given node of each of the plurality of nodes, assigning a color from a corresponding color set, the corresponding color set comprising at least one color from a community color set having a plurality of colors, the at least one color not being in one or more other color sets, the one or more other color sets corresponding to one or more nodes adjacent to the given node.

9. (Original) The method of claim 8, wherein, for each given node of the plurality of nodes, said assigning a color from the corresponding color set comprises:

designating the given node as a first node, the first node being an
uncolored node, and corresponding to a first corresponding color
set;

if the first corresponding color set is not empty, assigning a first color from the first corresponding color set to the first node; and

if there are one or more second nodes, the one or more second nodes being uncolored and adjacent to the first node, and corresponding to one or more second corresponding color sets, removing the first color from each of the one or more second corresponding color sets.

10. (Original) The method of claim 9, wherein if the first corresponding color set is empty, selecting one of the plurality of colors from the community color set.
11. (Original) The method of claim 10, wherein the selected color of the plurality of colors is a least-weighted conflict color.
12. (Original) The method of claim 9, wherein the first color is a color that minimizes memory usage.
13. (Original) The method of claim 12, wherein a color that minimizes memory usage comprises a color corresponding to a data size that is not divisible by a block size.
14. The method of claim 7, additionally comprising assigning a priority to each of the plurality of nodes.
15. (Original) The method of claim 14, wherein said assigning a priority to

each of the plurality of nodes comprises, for a given node of each of the plurality of nodes:

determining a weight for each of the one or more edges connected to the given node;

assigning to each node a priority corresponding to a greatest weight of the node's one or more edges connected to the node; and

ranking the plurality of nodes.

16. (Original) The method of claim 15, wherein said determining the weight to a given one of each of the one or more edges connected to the node comprises determining the weight based on a performance penalty associated with a hardware resource conflict represented by the given edge.
17. (Original) The method of claim 14, wherein said assigning a color to each of the plurality of nodes comprises assigning a color to each of the plurality of nodes in order of a corresponding priority assigned to each of the nodes.
18. (Original) The method of claim 17, wherein the hardware resource comprises a data bank, and the hardware resource conflict comprises a plurality of the at least one machine-executable instruction accessing the data bank in a same execution cycle.

19. (Currently Amended) An apparatus comprising:

~~circuitry~~ a compiler capable of:

scheduling a sequence of machine-executable instructions;

creating a conflict graph based on the sequence of machine-executable instructions, the conflict graph having a plurality of nodes and a number of edges, each node representing a data element accessed by at least one of the sequence of machine-executable instructions ~~instruction~~, and each edge, if any, connecting a pair of the plurality of nodes, ~~and representing to represent~~ a potential hardware resource conflict;

coloring the conflict graph to generate a colored conflict graph by assigning a color to each of the plurality of nodes, each color representing a hardware resource; and

creating a data layout by mapping each data element to a memory location, the memory location mapping to a corresponding hardware resource.

20. (Currently Amended) The apparatus of claim 19, wherein said compiler ~~circuitry~~ is additionally capable of assigning a color from a corresponding color set, the corresponding color set comprising at least one color from a community color set having a plurality of colors, the at least one color not

being in one or more other color sets, the one or more other color sets corresponding to one or more nodes adjacent to the given node.

21. (Currently Amended) The apparatus of claim 20, wherein, for each given node of the plurality of nodes, said compiler circuitry is capable of:

designating the given node as a first node, the first node being an uncolored node, and corresponding to a first corresponding color set;

if the first corresponding color set is not empty, assigning a first color from the first corresponding color set to the first node; and

if there are one or more second nodes, the one or more second nodes being uncolored and adjacent to the first node, and corresponding to one or more second corresponding color sets, removing the first color from each of the one or more second corresponding color sets.

22. (Currently Amended) The apparatus of claim 19, wherein said compiler circuitry is additionally capable of assigning a priority to each of the plurality of nodes.

23. (Currently Amended) A system comprising:

a memory having a sequence of machine-executable instructions that access a plurality of data elements in one or more memory

locations;

an L2 (level 2) cache having a plurality of data banks, each of the one or more memory locations mapping to one of the plurality of data banks; and

circuitry capable of:

scheduling a sequence of machine-executable instructions;

creating a conflict graph based on the sequence of machine-executable instructions, the conflict graph having a plurality of nodes and a number of edges, each node representing a data element accessed by at least one of the sequence of machine-executable instructions instruction, and each edge, if any, connecting a pair of the plurality of nodes, ~~and representing to represent~~ a potential hardware resource conflict;

coloring the conflict graph to generate a colored conflict graph by assigning a color to each of the plurality of nodes, each color representing a data bank; and

creating a data layout by mapping each data element to a memory location, the memory location mapping to a corresponding data bank.

24. (Original) The system of claim 23, wherein said circuitry is additionally capable of assigning a color from a corresponding color set, the corresponding color set comprising at least one color from a community color set having a plurality of colors, the at least one color not being in one or more other color sets, the one or more other color sets corresponding to one or more nodes adjacent to the given node.
25. (Original) The system of claim 24, wherein, for each given node of the plurality of nodes, said circuitry is additionally capable of:
- designating the given node as a first node, the first node being an uncolored node, and corresponding to a first corresponding color set;
- if the first corresponding color set is not empty, assigning a first color from the first corresponding color set to the first node; and
- if there are one or more second nodes, the one or more second nodes being uncolored and adjacent to the first node, and corresponding to one or more second corresponding color sets, removing the first color from each of the one or more second corresponding color sets.
26. (Original) The system of claim 24, wherein said circuitry is additionally capable of assigning a priority to each of the plurality of nodes.

27. (Currently Amended) A tangible machine-readable medium having machine-readable instructions stored thereon ~~data representing sequences of instructions, the sequences of instructions which~~, when executed by a machine, result in the machine performing the following:
- scheduling a sequence of machine-executable instructions;
- creating a conflict graph based on the sequence of machine-executable instructions, the conflict graph having a plurality of nodes and a number of edges, each node representing a data element accessed by at least one of the sequence of machine-executable instructions ~~instruction~~, and each edge, if any, connecting a pair of the plurality of nodes, ~~and representing to represent~~ a potential hardware resource conflict;
- coloring the conflict graph to generate a colored conflict graph by assigning a color to each of the plurality of nodes, each color representing a hardware resource; and
- creating a data layout by mapping each data element to a memory location, the memory location mapping to a corresponding hardware resource.
28. (Currently Amended) The tangible machine-readable medium of claim 27, wherein said machine-readable sequences of instructions ~~sequences of instructions~~ which, when executed by the machine, result in the machine assigning a color to each

of the plurality of nodes additionally results in, for a given node of each of the plurality of nodes, assigning a color from a corresponding color set, the corresponding color set comprising at least one color from a community color set having a plurality of colors, the at least one color not being in one or more other color sets, the one or more other color sets corresponding to one or more nodes adjacent to the given node.

29. (Currently Amended) The tangible machine-readable medium of claim 27, wherein said machine-readable ~~sequences of~~ instructions, when executed by the machine, result in the machine assigning a color from the corresponding color set additionally result in, for each give node of the plurality of nodes, the machine:

designating the given node as a first node, the first node being an uncolored node, and corresponding to a first corresponding color set;

if the first corresponding color set is not empty, assigning a first color from the first corresponding color set to the first node; and

if there are one or more second nodes, the one or more seconds nodes being uncolored and adjacent to the first node, and corresponding to one or more second corresponding color sets, removing the first color from each of the one or more second corresponding color sets.

30. (Currently Amended) The tangible machine-readable medium of claim 27,
wherein said ~~circuitry~~ machine-readable instructions which, when executed
by the machine, result in the machine ~~is additionally capable of~~ assigning a
priority to each of the plurality of nodes.